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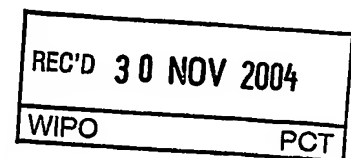
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Andrew Gervy

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Your reference Rapid Dev (UK)

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**The
Patent
Office****Request for grant of a
Patent****Form 1/77****Patents Act 1977****1 Title of invention**Rapid networked-application development for mobile
devices**2. Applicant's details**

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7 Inventorship

The applicant(s) are the sole inventors/joint inventors

Yes ☐No ☒

8 Checklist

Continuation sheets

Claims 0

Description 4 only 15

Abstract 0

Drawings 0

Priority Documents Yes/No

Translations of Priority Documents Yes/No

Patents Form 7/77 Yes/No

Patents Form 9/77 Yes/No

Patents Form 10/77 Yes/No

9 Request

We request the grant of a patent on the basis of this application

Signed:

Origin Limited
(Origin Limited)

Date:

6 November 2003

RAPID NETWORKED-APPLICATION DEVELOPMENT FOR MOBILE DEVICES

Name:

A method and framework for rapid networked application development on wireless mobile devices.

Summary:

There are many problems when developing networked software applications for wireless mobile devices. Key problems are:

1. there are a wide range of network connection options, such as Bluetooth, GSM, GPRS, IR and cable, that must be managed by the application
2. mobile devices do not have an adequate user interface for developing software
3. mobile devices typically have small amounts of memory and processing power, relative to laptops and desktop PCs, so the software developed must make very efficient use of resources.
4. Current programming approaches require either very skilled programmers (i.e. using C++ with detailed knowledge of Symbian) or make very inefficient use of the restricted resources of the mobile phone (e.g. using Visual Basic on Symbian requires 1MB runtime engine and typical applications are also usually more than 1MB).

There is no good solution to solving all of these problems that make it quick to develop networked applications for mobile devices.

The current main option for addressing 1 and 3 is to develop low-level code, in a language such as C++, that directly accesses all of these features on the phone. This is both difficult to learn and slow to develop applications for because of the detailed knowledge and programming skills required.

The current main option for addressing 2 is to use an emulator for the device running on a PC. This is not as rapid as it could be as the developer has to develop and test his application twice – once on the emulator and secondly directly on the device, and there are always differences in behaviour between the emulator and PC. This is especially true when writing networked applications as the emulator does not have the wide range of network connection options that are available on a phone so more testing needs to be done on the device.

The method and architecture of the invention is for a modular set of modular software elements, called pipe processors, that can be combined to solve the problems of 1, 2 and 3 in a way that significantly reduces the time it takes to develop networked applications for mobile devices. The invention consists of a set of components, called pipe processors, that are written efficiently in a software code suitable for the phone operating system, such as C++. These pipe processors are all called from a standard interface consisting of the name of the pipe processor and a set of options. The results of the pipe processor are returned to the calling element using a standard output and standard error.

Rapid networked application development is facilitated because

- All of the pipe processors have the same type of interface that can be called from a command-line interface, or other high-level language. This provides the developer with the means of solving the network management problems of 1 but without having to learn the details of a specific network interface or program in a low-level language such as C++.
- All of the pipe processors can be executed on the device remotely from the PC, so providing the developer with a good user interface for development but without having to develop software first on a emulator and then for the device.
- The modular architecture of the pipe processors means that modules can be included or removed as necessary. This means that software can quickly be developed that also makes efficient use of the restricted resources on the mobile device.

Is this new?

We are not aware of anyone doing anything similar. Some other scriptable languages are used on mobile devices, such as Simkin on Symbian OS, but these currently restrict the user to staying in the Simkin environment. Hence, the user cannot write applications that call Simkin scripts, and software written in other languages, and integrate all of these elements into a single application, as can be done with this invention.

What problem does this solve?

Rapid software development and reconfiguration, as all of the pipe processors can be called either from command-line, scripts, or other programming languages. Hence, the functionality can be quickly prototyped using scripting to prove the functionality before being codified into a programming language for the application.

Why is it not obvious to someone who is skilled in software development for smartphones?

This problem has been around for some time as mobile devices, such as PDAs, have been around for many years. Current approaches to this problem, such as using Java MIDP, cannot fully exploit the network features of the mobile device as they are constrained by the high-level interfaces required to make the development quick and easy. Also, all of the current approaches rely on the use of emulators on the PC. Our proposed solution is not obvious as current software engineers are using the current approaches that make software development and reconfiguration slow.

Variations and Related Ideas

There are two related variations to this, which may we think may be novel, namely

1. The use of the proposed framework by non-skilled programmers. Using the set of components that can be called from both a command-line interface, scripting language and variety of programming languages enables both phone users with no programming experience to 'program' software on the phone as well as advanced software developers, all using the same components. This enables

software to be modified by unskilled programmers to adapt it to uses that was not originally envisioned by a programmer, just by modifying the script on the phone. This can be used as a means of enabling non-skilled programmers to modify applications for their own use, or to quickly prototype and test an application that can be handed to a skilled developer for turning into a complete networked software application for mobile devices. Also, it allows someone to modify a software application when all they have is a mobile device, for example when they are on the train. Usually software will be developed from a PC, with a link to the mobile device. However, if the application is scripted on the mobile device then when you are away from your PC, the script can be quickly modified to create a different application, without the need to compilers, debuggers, emulators and the other development tools required for standard PC-based software development.

2. The use of the proposed framework to provide a single interface from a wide range of programming languages, including command-line and scripting interfaces, to mobile device running a wide range of operating systems. Hence, a programmer can choose whatever language they like to develop the software, and does not have to learn different interfaces for different mobile devices. This is similar in concept to using Java MIDP as a basis for writing portable applications for smartphones. However, using Java MIDP it is not possible to write good networked applications for mobile devices as Java MIDP standard does not allow access to the necessary networked features on the phone. This can be achieved by extending the MIDP programming interface with additional mobile-device specific interfaces, but this requires the developer to understand the different interfaces for each phone. The proposed framework eliminates this problem by providing a common interface to the low-level networking and other phone features that is common across different mobile device operating systems.

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